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**COMPARATIVE ANALYSIS –  
THE IMPACT OF THE COVID-19  
PANDEMIC ON THE FINANCIAL  
EDUCATION OF UNIVERSITY  
STUDENTS**

**BOTOND KÁLMÁN  
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## **1. INTRODUCTION**

The upward development of the global economy is made possible by recurring crises. Recession affects every participant in an economy and causes financial problems for everyone. The solution to these problems cannot be found without the individual in question having the necessary financial knowledge which they can employ in practice.

Ever since the regime change (democratic transformation in Hungary in 1989), public and higher education in Hungary have been geared towards establishing a competency-based approach. Such competencies included economic knowledge, which is essential for making day-to-day financial decisions. Within the educational ladder, higher education offers the final opportunity for the sufficient provision of this knowledge, as once students receive their degree and enter the labour market they are basically left to their own means and will rely on knowledge they received previously. The problem becomes especially important during a situation that results in an unexpected economic recession, such as the Great Recession or the global economic shutdown in 2020, which resulted from the coronavirus pandemic.

## 2. OBJECTIVES

The original goal of my research was the examination of financial knowledge and behaviour of higher education students pursuing an academic subject chosen as a field of specialisation in economics (hereinafter: economics majors) and in disciplines outside of economics (noneconomics majors). The appearance of the *coronavirus disease 2019*, hereinafter *COVID-19*) made the change in research objective necessary. Regarding the pandemic I examined whether higher financial knowledge gained through studying economics led to more effective economical behaviour in contrast to students from other faculties. Based on this I defined the results of my study in the areas indicated in Table 1.

**Table 1: Areas of examination in the study**

The examined subareas	
<b>I.</b>	<p>I examine the level of financial knowledge, financial behaviour patterns and the relationship with finance, as well as the development of financial security and financial preferences among Hungarian and foreign economics and noneconomics majors.</p> <p>My method is to create my own index based on my own offline questionnaire and to process the answers of demographic groups with statistical methods.</p> <p>My aim is to prove the conclusion that can be deduced from the literature that economics majors perform better in the fields of financial culture than their peers in other fields of study.</p>

<p><b>II.</b></p>	<p>I examine the characteristics of groups of the same students that can be differentiated based on the components of financial culture.</p> <p>As a method, I used cluster analysis based on my own indices.</p> <p>My goal is to determine the extent to which certain components of financial culture influence students' responses to financial problems.</p>
<p><b>III.</b></p>	<p>I examine the correlations between the components of financial culture.</p> <p>To examine the relationships, I used cross-tabulations and linear regression, and to detect causal relationships, I employed the same algorithm as the one used to create decision trees.</p> <p>My aim is to determine the interactions and causal relationships between the components of financial culture.</p>
<p><b>IV.</b></p>	<p>By comparing the responses received before and during the pandemic, I explore the similarities and differences between the two time points.</p> <p>My goal is to show and compare the extent and direction of changes in each group.</p>
<p><b>V.</b></p>	<p>I also compare the responses to the two queries by country and by groups based on the demographics of the sample, focusing primarily on change but also covering similarities.</p> <p>Within the question I examine whether the pandemic has changed the level of financial literacy and financial awareness among higher education students, and to what extent this change has affected individual groups of students.</p> <p>I analyse how the frequency of using cashless financial services has changed because of the pandemic in the studied groups.</p> <p>I review the extent to which the introduction and maintenance of the pandemic and related restrictions have affected students' sense of financial security and general stress.</p>

Source: author's own research

### 3. LITERATURE REVIEW

Since the late 1980s, a few studies have been conducted examining financial knowledge and financial literacy. DANES and HIRA (1987) examined credit card use, insurance, and personal loans, and CHEN and VOLPE (1998) conducted a financial literacy survey among US university students. They found that female students under the age of 30 with neither work experience nor economic specialisation had the lowest level of knowledge. These students with less knowledge are more likely to make wrong decisions.

BEAL and DELPACHITRA (2003), measuring the financial literacy of Australian higher education students, found that university students are not proficient in financial matters and do not have the appropriate skills. According to their results, students with higher financial literacy scores are more likely to be men, have more work experience, and have higher incomes. It has also been shown that the level of financial literacy improves depending on work experience and income.

LUSARDI et alii (2009) examined the financial literacy of young adults. They have shown the level of financial literacy to be generally low; less than a third of young adults have a basic knowledge of, for example, interest rates, inflation and risk diversification. Both foreign (WILLIS 2011a, 2011b) and hazai (NÉMETH 2015) experts raised serious doubts about the Hungarian and international education of financial literacy.

One part of financial literacy is financial attitude, i.e., an individual's relationship to money and finance (NÉMETH et al. 2017), which is a motivating factor for financial behaviour. There was attitude measurement also in Hungary (ZSÓTÉR et al. 2015), in which the authors described three types of attitude: those who considered themselves conscious, those who planned for the short term, and those who could make conscious decisions.



Hungarian researchers, e.g., LUKSANDER et alii (2014), found that secondary financial education had a positive effect on later financial knowledge but not at all on practical skills. However, the importance of financial literacy has also become important for mastering the proper use of modern banking services (SUSANTI – HARDINI – BAHTIAR 2020). Adequate knowledge facilitates effective risk management and thus helps to avoid many pitfalls (VENKATARAMAN – VENTATESAN 2018). Although the relationship between financial intelligence and educational attainment can be demonstrated, several studies also show that often those with higher education are not able to make the right financial decisions for themselves, for example when choosing to retire or invest (KOSSEV 2020). At the same time, financial literacy can increase your ability to manage financial stress.

The practical significance of the issue became important during the 2008 financial crisis, when millions of consumers were struck by the need to manage their finances. In addition, a lack of financial literacy can cause not only individual or family tragedies but also economic crises, such as the global credit crunch that began in 2008 with bad loans – as shown by the Standard & Poor's Financial Awareness Survey (KLAPPER – LUSARDI 2020). The crisis has also highlighted the lack of adequate financial literacy as one of the main causes of financial vulnerability. This threat hovers not only over older people, but also over the younger age group leaving the more modern education system (NÉMETH et al. 2017), and this fact draws attention to the importance of teaching and transferring financial knowledge within the framework of formal learning. I add to this that even when examining the financial culture of young people, it is worth paying attention to financial knowledge, behaviour, and attitudes alike (ATKINSON – MESSY 2011).

At the beginning of my research, having reviewed the literature I formulated five hypotheses.

- H1: Economics students in Hungarian and foreign higher education perform better in the field of financial culture; their sense of financial security is higher than that of students studying in other fields.
- H2: There are also differences in financial literacy and awareness by demographic variables and countries.
- H3: There is an interaction between the components of financial culture. Based on the individual level of each component, students can be typed and grouped.
- H4: The pandemic has increased the importance of financial literacy among higher education students and increased their financial awareness.
- H5: As a result of the epidemic, the financial security of noneconomics majors has decreased more than that of economics majors.

The ultimate goal of my study was to highlight the increasing importance of financial knowledge in crises, and its role in solving problems. For this reason, I contrasted the financial knowledge, behaviour, and attitude of students in Hungarian and foreign higher education before and after the first wave of the pandemic.

## 4. MATERIAL AND METHODOLOGY

### 4.1. The sample

Because the primary goal of my research was to measure the financial knowledge and activity of students in higher education, I chose to employ a quantitative research questionnaire. My sample consists of a large group of respondents, several students at domestic and foreign universities. The group contained students both economics and noneconomics majors. Respondents were chosen from universities indicated in Table 2.

**Table 2: Universities involved in the study**

<b>Hungarian universities</b>	
EKCU (EKE)	<i>Eszterházy Károly</i> Catholic University – Eger
METU	Budapest Metropolitan University of Applied Sciences
ELTE	<i>Eötvös Loránd</i> University – Budapest
BBS (BGE)	Budapest Business School
UP (PE)	University of <i>Pécs</i>
<b>Foreign universities</b>	
WU	Wirtschaftsuniversität Wien (Vienna University of Economics and Business)
EUBA	Ekonomická univerzita v Bratislave (University of Economics in Bratislava)

Source: author's own research

The study extended to seven faculties at seven universities. The study itself did not focus on the faculties, rather on the programmes they offered which I grouped arbitrarily into three educational fields based on their area of education: economics; jurisprudence (law); and humanities (liberal arts), pedagogics (education), and arts jointly (hereinafter philology–pedagogy–art(s)). I used the same questionnaire for both years. In 2019 there were 1,549 respondents and in 2020 there were 1,712. Gender distribution was similar in both years with the ratio between women and men being 2:3. Based on age the two studies are very similar and there is only a small difference in the ratio of those who were 23 or older. They had less representation in the first study than they did in the second. Slightly lower proportions of the residents of the capital were included in the sample in 2020 and slightly more people were involved from urban agglomerations and villages, but this did not cause a significant shift in proportions, so the two samples remained comparable.

The rate of full-time and part-time students was similar during both studies. Approximately 80% were full-time students and 20% studied part-time. I also examined how many of the respondents were full-time students and how many worked alongside university. The rate of full-time students was around 80% during both years. Within the 20% that worked, 15% had white-collar jobs (mental work, intellectual work) and 5% had blue-collar jobs (physical work). I also distinguished between working students according to their position at work. I put them into three groups: employees, middle management, and upper management. I created a separate category for entrepreneurs and included students who ran their own business or were an executive at one. The ratio between categories remained similar during the two studies.

## 4.2. Research method

After viewing the literature regarding methodology, I chose to employ the offline questionnaire method as I expected fewer distorting effects and a higher response rate than an online version would produce. My expectations came true: I managed to achieve a 92% response rate. When designing the questionnaire, I chose to use closed questions, the only exception being the question pertaining to age. Closed questions were necessary because I was doing quantitative research, and this required the statistical convertibility and processing of the gathered data.

My questionnaire began with questions pertaining to the demographic description of the sample. Following this I separated questions into three groups: groups of questions examining financial knowledge, financial habits, and financial attitudes. I created these questions using the same methodology used at the Organisation for Economic Co-operation and Development (hereinafter OECD); however, in certain groups instead of asking the questions established by OECD I asked my own questions that were based on the scientific literature. I assessed financial knowledge using 32 questions and statements. To examine financial behaviour and attitude, I used 18 and 15 questions/statements respectively. I did not place these questions in separate blocks, but the whole questionnaire was heterogenous. The three main groups of questions were expanded upon with a 4<sup>th</sup> and 5<sup>th</sup> question group concerning financial sense of security and the general anxiety levels of students in higher education. These however were grouped in individual blocks at the end of the questionnaire.

For demographic description, on the one hand, I grouped characteristics common in statistical analyses (*i.e.*, gender, age, residence); on the other hand, relevant elements of my current research (*i.e.*, which faculty they attended, which year they were in, which mode of study they chose, if they worked in addition to their studies) listed among demographic characteristics. To assess financial knowledge, I used questions related to everyday life. For financial awareness I created a group of questions with two focuses. I inquired about the financial tools each participant had, what services they used and how frequently they used these services. When assembling this group of questions, I used the scientific literature as a sample. The questions became finalised during the pilot test that preceded the finalisation of the questionnaire.

To code and record the data I gathered I used Microsoft Excel 365 (hereinafter Excel). Data cleaning was done through the R programme package (RStudio). During statistical processing I used Excel and the IBM SPSS statistics

software. During the creation of road models, I was aided by the IBM SPSS Amos programme module.

The contrasting statistical examinations were done through conventional statistical methods, *inter alia*, t-test, analysis of variance (ANOVA), Mann–Whitney *U* test, and Kruskal–Wallis *H* test. When contrasting multiple groups, I used *post hoc* tests (using the *Bonferroni* correction) to find out whether the group pairs deviated significantly from each other. The validity of grouping variables was tested with *Cronbach's alpha*, which gave information on whether the variables really measured that which we intended to measure. Through averaging, summarising and the following normalisation, I also created my own indices to rate financial knowledge, behaviour, and attitude. The value of these indices falls between 0–1. I assessed the relationship between indices and nominal variables (gender, residence, marital status) with the Spearman's rank correlation coefficient, while the relationship between indices and scale variables (e.g., age) was assessed with the Pearson-correlation coefficient. In case of nominal variables, I examined the relationship between indices and nominal variables through cross-tables, demographic, and the effects of demographic and qualitative variables in a generalised linear model (GLM). made by covariance analysis (ANCOVA). I also used correlational and two sample tests for comparing financial knowledge and activities.

Through cluster analysis I examined the types of groups that could be formed based on similar answers being given by the various groups to questions on financial habits, behaviour, and attitudes. Because the existence of the correlation does not show the cause-effect relations, I performed further examinations to explore these relations. From among the usual procedures, the Simon method could not be used because of the sample size, while the Granger test could not be applied because of a lack of time series. I had to use a technique that therefore that was suitable for determining whether higher degrees of financial knowledge really did result in more conscious financial behaviour. In the end I chose to implement decision trees which were suitable for both classification and prediction.

## **5. RESULTS AND DISCUSSION**

I have structured the demonstration of results along the pillars of financial culture of the OECD methodology. Within each pillar I have detailed the results of the regression models, cluster analyses and the chi-squared automatic interaction detector (hereinafter CHAID). Through this I can hopefully provide an overview of the subject of my research.

### **5.1. Financial security**

Because I focused my research mainly on decisions during environmental crises, financial sense of security was of primary importance. According to the results of my study, the greatest factor that influenced this was the passage of time. No other variable had as large an effect as time did. Based on this I can state that university students found their financial situation significantly more uncertain. Because there was no significant relationship between the year of survey and university majors, worsening financial sense of security was a factor that affected every respondent. Based on job position however I was able to find some differences. The sense financial security among those who worked alongside university decreased to a greater extent to those who were full-time students. This was especially true for students who were also entrepreneurs. Out of the quantitative variables, financial knowledge and attitude were shown to have a visible effect on sense of security as an increase in both resulted in a decrease in a sense of security. Out of these two variables, financial knowledge proved to be the more important as based on the road models, the role of financial attitude did not have a visible effect.

The relationship between age and sense of security proved to be interesting as well. Before the pandemic those who were older found the situation more threatening which was down to their greater knowledge and experience which allowed them to see their situation more clearly. During the survey following the first wave of the pandemic however the results were reversed. This time younger people tended to have a worse sense of security. My theory on this is that the uncertainty brought along by these environmental changes had such a strong effect on the younger generation that it made them less able to see a way out – because of their lesser knowledge and experience – and thus experienced a greater sense of threat than the more experienced and seemingly calmer older generation. The role of age regarding this matter is highlighted by the models. In this matter I found that regarding both economics and noneconomics majors, age played in indirect role in achieving a sense of security through the level of financial knowledge. This indirect effect may be

modified by the pandemic, and this produced a negative effect on financial security to the same extent. This means that my observations prove my general theory that the crisis is threatening to everyone. Although this variable was not included in the models based on the correlation examination, linear models show that the programmes students study at university have an effect on their sense of financial security. Philology–pedagogy–art students had a demonstrably larger sense of financial security than their economics and law student counterparts. This observation leads to the conclusion that university majors have an indirect effect on a sense of security through the level of financial knowledge. The adage ‘ignorance is bliss’ seems to be an obvious explanation for the higher sense of security that accompanies lower levels of financial knowledge. In fact, lesser knowledge results in perceiving less threats, thus decreasing a sense of danger. This, however, does not lead to a happier life at all as the threat remains real even if the person under threat is unaware of it. This last line of thought also proves the necessity of increasing financial knowledge.

The five clusters created during cluster analysis can be described with significantly differing financial security. Those who are ‘reclusive’ seem to have the highest sense of financial security (or at least this is what they claim so that they do not need to concern themselves with finances). They are a group characterised by the lowest performance in the areas of financial knowledge, behaviour, and attitude. The ‘finances are important, but that’s all’ and the ‘middle-of-the-roaders’ clusters’ sense of financial security is lower than that of the ‘reclusive’ group, but there is no significant difference between the two groups. The sense of security for the ‘I’ve done what I can’ group was practically the same as the previous two groups. Contrasting these three groups with similar levels of security sense, I determined that attitude does not play a role in establishing a sense of financial security as these groups were distinguished based on their differing attitudes. It can also be observed that financial knowledge is inversely proportional to the sense of financial security. The gender ratio in the ‘reclusive’ and ‘I’ve done what I can’ clusters is almost identical. Among the ‘finances are important, but that’s it...’, the ‘middle-of-the-roaders’ and the ‘conscious and proactive’ clusters there are somewhat more men. This indicates that men typically have average or below average sense of financial security while women were shown to have high, average, and below average levels of financial security sense. It seems the classical stereotype that the man is responsible for ensuring material conditions is still alive and that’s why it is men who are more likely to be worried about their own and their families’ financial security. In the case of women, self-sufficiency is part of the modern gender role, so all levels of financial sense of security can be observed. Through a separate cluster analysis, I examined the group of economics majors. The level and differences in financial sense of



security completely correspond to the findings regarding the total sample size. The only difference is that the difference between male and female students is not apparent in the cluster of economics majors. This shows that, in the case of the other two majors, the tendency is similar to the previously mentioned differences between men and women. That is, regarding economics majors, I was unable to demonstrate whether any of the clusters were more peculiar to either gender group.

The weak effect of financial attitude is not only showcased by linear models but also by path models. It is readily apparent from these that financial attitude has a significant effect on sense of security only with economics majors. The same was not found to be true for philology–pedagogy–art majors.

## **5.2. Financial knowledge**

Based on the observations made above, the level of financial knowledge is crucial. This is an important issue as the competency-based approach of the Hungarian educational system places a great emphasis on teaching theoretical and practical economic knowledge. As the likelihood of this claim being true was high based on the scientific literature, I also placed significant emphasis in assessing financial knowledge in the survey. Assessing financial knowledge is of paramount importance also in my questionnaire. The number of questions relating to this is the same amount as the number of attitude and behavioural questions put together. Financial knowledge is influenced by several factors, most importantly the year of the survey and the major studied at university. Even the interaction between the two proved to have a significant effect. This last part was a result of the fact that the financial knowledge of economics and law majors was not only significantly better than that of philology–pedagogy–art majors, but it also significantly increased between the two examination periods. This same increase could not be detected among philology–pedagogy–art majors, however. This confirms that the curriculum of a noneconomic higher education does not provide sufficient knowledge of economics for future decision-making. Country of education did not prove to be an influencing factor which means that higher education in Hungary is not behind Slovakia and Austria in terms of providing education about economics. This observation is slightly differentiated by the fact that during the one-year period between surveys the knowledge of Hungarian and Austrian students did not increase significantly while the same was not true from Slovakian students. I shall once more draw attention to the fact that, however, that the role of country did not play a significant role regarding financial knowledge. By analysing the role of discipline and country as a cluster, I found that there are differences in financial knowledge. The two clusters with the highest level

of financial knowledge were the conscious and proactive and the ‘I’ve done what I can’ groups. The occurrence of these two groups was highest in Austria (40%), while the occurrence in the Hungarian and Slovakian sample was similar (30%), however, based on the model results above, the difference is not significant. Similar ratios can be observed according to educational field: this level of knowledge can be observed in 40% of economics and law majors but only in 15% of philology–pedagogy–art majors.

Study schedule, however, proved to be an important factor. It became apparent that the knowledge of part-time students is significantly higher than that of full-time students. One possible explanation for this is greater experience which those who work alongside university possess. On the other hand, an increase in knowledge was only significant for full-time students. This result reaffirms that full-time higher education is an important – if not the most important – source and opportunity to provide knowledge within the framework of organised education. Attitude also had a positive effect on financial knowledge: a greater interest in finance is motivating force to increasing financial knowledge. Financial behaviour and activity have the same effect on knowledge. This means that those who are more active in their finances gain more knowledge which primarily manifests itself in the form of experience which is equally considerable.

The level of financial knowledge therefore is dependent on multiple factors which is shown by the fact less than a third of the variance was explainable with this index’s variance. Mostly university major, age and financial behaviour determined the level of financial knowledge. The saying ‘practice makes perfect’ has been proven in multiple ways, as those who are more interested and more active in finance also possess a higher degree of knowledge. The effect of financial attitude and behaviour on knowledge is positive, meaning that the more conscious someone is in finance, and the more they take advantage of financial situations, the higher their financial knowledge is.

### **5.3. Financial attitude**

Financial attitude played an important role in both the methodology of the OECD and my own survey. The changes that occurred during the one-year period are not that big, but they are significant. This indicates that the pandemic had an ‘activation’ effect on everyone. Out of the students of the examined programmes, law majors were the most vivacious, followed by economics majors, and finally by philology–pedagogy–art majors. Part-time

students participate in financial matters more frequently and are more active in more areas than their peers.

The effect of financial knowledge mainly suggests that greater knowledge also aids practical application. The same is suggested by the fact that part-time students, who have a higher financial knowledge, are also more active financially than their full-time student peers. This suggests that greater knowledge increases financial activity which through new experiences leads to further gains in knowledge that in turn increases activity. and so forth. This is a seemingly self-perpetuating mechanism, but it is almost certain that this is not the case. If I had written this paper as a physicist, I would say the following: *perpetuum mobile* not possible. If I were a biologist, I would say that even the unrestricted growth of a population is restricted. And if I were a philosopher then I would say: It is impossible to determine what came first, the chicken or the egg. In the current case, however, I would explain the seemingly paradoxical result by saying that correlation does not imply causation. Based on the available information it is impossible to determine what constitutes as the cause and what constitutes as the effect.

As my sample and time series were not large enough to perform cause and effect tests, I applied the CHAID algorithm, which I used with the decision trees to determine the cause-and-effect relationships. Of course, the primary use of the decision tree is not to find the cause and effect, therefore the results that I received are restrictive and are only suitable for drawing a couple of conclusions. I will return to this matter when discussing the results regarding financial attitude.

In 2020 higher stress because of the pandemic became an influencing factor on behaviour, which of course reduced financial activity. This effect, however, was not strong enough as even though the decrease was significant, it was not that important regarding its extent.

Financial behaviour was the explained variable for road models. Amongst the road models created on countries there was a single common connection which was that financial knowledge has the reasonably same, significant positive effect on behaviour. I managed to showcase this in all three countries; however, the effect of other variables was different. In addition to the level of knowledge, age and the epidemic-induced stress had a significant direct effect on financial behaviour in Hungary, only the attitude had one in Austria, and the attitude and the pandemic had it in Slovakia. Considering the full effects, the role of knowledge and age is decisive in the case of Hungary, the effect of the other variables is smaller than these. In the road model of Austria, knowledge and age have the greatest effect as well, but here the effect of age

is much weaker than in Hungary. In Slovakia, in addition to the level of knowledge, the impact of the epidemic was a major influencing factor.

Significant differences and similarities can be observed in the models of the majors. The most important factors influencing behaviour amongst economics majors was knowledge, age, and attitude. Among philology–pedagogy–art majors, knowledge, age, and the effect of the pandemic proved significant, and in the case of law majors, neither factors had a significant effect on financial behaviour.

Regarding university majors a tendency can be observed showing that the pandemic negatively impacted the financial sense of security of university students. An important difference is that age primarily had a negative effect for economics majors regarding their financial attitude and a positive effect regarding their financial knowledge. These tendencies were not present or were present to a lesser extent for students of the other two groups. The effect of age on financial knowledge and the effect of financial knowledge on financial attitude and behaviour was weaker in the case of economics majors than it was with philology–pedagogy–art majors. The positive effect of the pandemic was only demonstratable with philology–pedagogy–art majors, however.

#### **5.4. Financial behaviour**

Financial attitude measures how important participation in financial matters is to someone, how close they are to financial activities and how purposeful are they in this area. Out of every modelled variable this had the least significant explanatory ratio: only 14.11%. Only the university major, work outside of university studies and financial knowledge have a significant effect on financial attitude, the effect of the other variables was significantly weaker. Interest in finance was greater amongst economics majors, followed closely by law majors and then philology–pedagogy–art majors. The one-year period of the pandemic, however, only brought significant decrease for law majors; the attitude of other majors did not change significantly.

Concerning countries, interest decreased in Austria and Slovakia. Regarding occupational groups I was able to establish the following order: Those who worked in white-collar jobs outside of university had the lowest financial attitude while those who worked-blue collars jobs were significantly more attracted to finance. Those who were full-time students and had no job were shown to have the highest financial attitude. The effect of quantitative variables is very small, I highlighted only the effect of financial security. Its negative effect on financial attitude indicates that security brings about

comfort, meaning that those who are certain of their financial situation are less likely to seek out new financial knowledge.

Based on the results of the path models, attitude is influenced by age and the level of financial knowledge. The effect of age is negative, meaning as age increases, interest in finance decreases. The explanation I provided for this was that increasing everyday chores take away time from financial matters. The effect of age is, however, only significant in the case of economics majors and is not significant for philology–pedagogy–art majors.

During cluster analysis I created the various clusters based on financial attitude. Based on this I differentiated five different attitude types based on the relationship between the knowledge-attitude-behaviour indices. Out of the five groups three had almost identical indices within the group. In the case of the conscious and proactive all three index values were high, meaning their attracting to finance has a theoretical basis and they also employ their knowledge in practice. In the ‘middle-of-the-roaders’ group, all three indices were average making this cluster the most well balanced. The ‘reclusive’ group contains university students who have low index scores in all three areas. As a result of low financial knowledge, the ‘reclusive’ group only shows minimal activity regarding finances and denote little importance to the area. The two ‘peripheral’ cluster differ from these three in that one of the index values differs from the rest. The ‘finances are important, but that’s all’ group has exceptional attitude in contrast with knowledge and behaviour which means that members of this cluster place a greater importance on finance than what they would be capable of based on their knowledge and activity. The ‘I’ve done what I can’ group has the lowest levels of attitude out of all the groups. They are university students that are reasonably well-informed around finance; however, they do consider it to be especially important they ‘only’ act. Based on gender, country, residence there are no relevant differences between clusters.

There is a significant difference, however, based on schedule, as 40% of full-time students ‘find finance to be important but that’s all’. On the other hand, the same percent of part-time students are ‘middle-of-the-roaders’. This also confirms my results that indicate that the role of experience is significant in determining financial attitude. The ratio of the conscious and proactive is the same in both groups which indicates that based on practical experiences, the ‘finances are important, but that’s all’ attitude moves respondents at least into the ‘middle-of-the-roaders’ category, and in some cases to the ‘I’ve done what I can’ category. The prevalence of the ‘middle-of-the-roaders’ group amongst university students with white-collar jobs is 40% which also confirms the importance of day-to-day experiences. There are significantly more ‘castle-builders’ amongst full-time students with the attitude of ‘finances are

important, but that's all', while only 5% are realists with an 'I've done what I can' attitude. This supports the previous results indicating that in the division based on position, the same results were found in the full-time student group. Among those who worked alongside university, entrepreneurs proved to be the most practical: this group had the highest rate of conscious and proactive and 'I've done what I can' attitude with half of those who were entrepreneurs besides being students displaying these two attitudes, while close to a third of them preferred the 'middle-of-the-road' attitude.

The importance of university major is strengthened further by the CHAID analysis (decision tree), as the first division is based on this. The distribution of economics and law majors based on the attitude cluster is very similar to that of the entire sample which is also explained by the fact that these students have a representation of 80%, while the rate of philology–pedagogy–art majors was 20%. The two groups differ in the ratio of 'reclusive' and 'conscious and proactive' attitudes: 2% of economics and law majors were 'reclusive' while almost a quarter of philology majors had this attitude. However, the ratio of conscious and proactive in the two groups is the other way round. The role of age amongst noneconomics majors is significant, and it is the basis for division within their group. These students possess no special knowledge of economics; therefore, in their case age indicates experience, thus confirming my statement on the importance of experience. The cut-off is at the age of 23. For those who are older the ratio of the 'middle-of-the-road' attitude is twice fold, while the ratio of the 'reclusive' attitude is only half compared to those who are under 23. Based on this it seems that financial maturity is not connected with legally becoming an adult, but rather with getting a degree (getting to the age of 23 to be precise).

## **5.5. Financial preferences of economics majors**

In terms of financial preferences, I examined a partial sample of economics majors. I offered four options in my survey which I formulated based on the scientific literature. The most popular answer was financial stability during old age (38%), while the financial security for my children and higher income was chosen by 30-30% of respondents. A better home than my current one option was chosen only by 2% of students as an indicator of living standards. Out of the variables, the year of the survey (the pandemic) had the greatest effect on the development of preferences for life quality.

Before the pandemic the two most popular answers were higher income and financial security in old age with 40–40% of respondents choosing these answers. As a result of the pandemic, however, 'higher income' decreased to

21% and its place was taken by 'financial security for my children' with 40%. Variables generating significant differences within the complete sample (i.e., survey year, country, sense of financial security, financial attitude) were not as significant when broken down to individual years. This is primarily because the value of indices showcasing significant relationships within the complete sample changed greatly from 2019 (pre-pandemic) to 2020 (pandemic). This means that the moderating effect of the survey year appears here, too.

There was a significant difference in the distribution of answers based on countries in both periods. The greatest difference was in Austrian replies, where rate of those who identified a higher quality of life with the financial security of their children increased from 0 to 45%. An increase was also observed in the Hungarian and Slovakian subsamples, where the ratio of those wishing to care for their children increased one and a half times. Variables such as financial sense of security, financial activity and attitude, place of residence, schedule and work position did not shift in preferences during the year between the two surveys.

As an effect of the pandemic on gender as a factor for division, I found the following in the country groups: the number of respondents choosing the answer of ensuring their children's financial safety increased. Twice as many men (40%) chose this option; more than that, the ratio of women that found this to be the most important was even higher than that of men. Thus, it can be said that the most prevalent change in all demographic groupings is the plan to ensure the financial safety of children (almost twice the rate than previously), while the importance of high income decreased. Based on the CHAID algorithm, which refined the results of the regression models, the year of the survey was found to be the most important, with the country being the second most important explanatory factor.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

Based on the observations above, the level of financial knowledge is of key importance. It is also important to emphasise the matter because in the domestic education system the competency-based approach attaches great importance to the theoretical and practical education of economics. As the likelihood of this statement was already strongly suspected based on the analysis of the literature, the assessment of financial knowledge was emphasised in my questionnaire. The number of the applicable questions are almost the same as the total of the questions examining behaviour and attitude. I evaluate the conclusions that can be drawn based on the rate in which they

support or contradict the hypotheses I have compiled at the beginning of my research.

My first hypothesis on the better performance of economics majors was proven correct, but the law majors also performed on a similar level, significantly outperforming the students of the other three majors. The CHAID algorithm (decision trees) support the importance of the discipline. These confirm my results as according to the algorithm the most important class-defining characteristic of financial knowledge is the major the student is enrolled in as this was the first split point. The year of the survey and the major, as well as the interaction of these also had a significant effect on financial knowledge. The latter is because the financial knowledge of economics and law majors is not only significantly better than that of philology–pedagogy–art majors, but it also grew significantly in the period between the two surveys. The same growth, however, was not observed among the philology–pedagogy–art majors. This observation proves that the curriculum of a general (noneconomics) higher education programme does not provide adequate economic knowledge to make good future decisions.

My second hypothesis was that levels of financial knowledge and consciousness differ according to demographic characteristics and countries. I was unable to prove beyond all doubt the role of the country as it only has a weak effect on financial performance. In the Austrian and Slovakian sample there are only economics majors; thus, I separately examined a partial sample comprising only economics majors. According to these clusters, Hungarian students are so ‘conscious and proactive’ or – at least – ‘middle-of-the-road’ as Austrian and Slovakian students, as most of the ‘reclusive’ Hungarians study philology–pedagogy–arts. Based on this, I concluded that the country (that is the system of higher education) does not cause a significant difference in the level and quality of obtainable financial knowledge. The role of the country as a group-creating characteristic of small significance around financial knowledge is further confirmed by the only third-level split point of the decision trees, that is, it happens within the group of full-time students according to country, but the Hungarian and Austrian students were placed on the same branch here too. From among the variables of demographic apart from age, being employed in addition to their studies proved to have a significant effect with both having an effect due to increased practical experiences.

Economics and law majors showed not only higher levels of knowledge, but their knowledge also grew at a higher rate than the one of philology–pedagogy–art majors. The fact that the difficulties posed by the virus have made financial knowledge more important very likely plays a role in this, thus the students of economics and law faculties invested energy in gaining plus



knowledge. Based on this my third hypothesis that presumed the increased value of financial knowledge, was proven correct.

My fourth hypothesis said that the pandemic further decreased the financial security felt by those not enrolled majors related to economics. I was unable to confirm this proposition because although the sense of financial security decreased everywhere, I found that the sense of security of noneconomics majors was significantly higher. This is explained by the fact that a sense of security is a subjective factor. It seems that the more someone knows the more aware they are of the gaps in their knowledge and the dangers this poses. This leads to them feeling less secure than those who have less insight into the matter.

A further important result is that economics majors are not characteristically 'reclusive'. There is a difference between them, however, based on whether they are full-time or part-time students. The former cluster takes the attitude that 'finances are important, but that's all' and 'I've done what I can'. This means that either finances are important to full-time students but they lack sufficient knowledge, or they have a high level of financial knowledge but financial matters are not more vital to them than other issues. Part-time students on the other hand are more 'middle-of-the-road' or 'conscious and proactive'. The latter result once again underscores the importance of practical experience.

As all obtained knowledge is only worth as much as it can be put into practice, I placed financial behaviour at the centre of my analysis and I examined the rate at which financial knowledge and attitude influence it, furthermore what other factors influence it. In my model, age, the pandemic, and the associated stress were included as possible factors, the latter, however, visibly affected the financial behaviour of not only noneconomics majors. All of these have a direct behaviour-influencing effect, but most of them have indirect influence as well.

## 7. NEW SCIENTIFIC RESULTS

### **R1. Hungarian educational system in economics is not lagging behind the other examined countries.**

This observation is a logical consequence of my finding that the country alone does not play a significant role in the difference in students' financial literacy. Of course, my 1<sup>st</sup> result ('R1') does not substantially mean that everything in Hungarian higher education in economics was perfect, but it is a good starting point for further development. Especially in the current situation, before the second wave of the coronavirus pandemic, this is an important issue that will require new approaches and further developments from decision makers as well as a paradigm shift from faculty and students. This is especially important nowadays, when Industry 4.0 and the related exponential advances in science and technology are also emerging in finance. New financial solutions, such as cashless payment methods, internet banking services, internet banking services available via mobile phone applications or banking service providers operating according to the digital business model (*Revolut, Transferwise*), are becoming commonplace. Using them and understanding their operation on a day-to-day basis requires such economic competencies that need to be taught. This knowledge shall also be incorporated into the content of economic programmes, which must be constantly updated. The change in the crisis has led to a greater increase in the level of knowledge among full-time students. This, in turn, clearly suggests that the most effective way to expand knowledge is through full-time higher education. The importance of this task is also indicated by my own results, which show that the curriculum of a general (noneconomic) higher education programme does not provide sufficient economic knowledge for future decision-making. This is supported by the finding that economics majors also respond more successfully to the financial challenges of life. Result 2 ('R2') seemingly contradicts this statement.

## **R2. Law students perform just as well as economics majors.**

In my opinion, however, it tends to support my hypothesis, as law majors also received a high level of financial law training. That is, they also perform well due to their high level of knowledge. The field of study is thus decisive in the development of financial knowledge. However, it also follows that the material and method of training must be differentiated, i.e., a significantly different material ought to be compiled for the economics subjects of noneconomics majors than for economics majors. I mean not only content but also methodological differences by ‘other’. With a student with a fundamentally human mindset, curricula built on the train of thought of hard sciences are unlikely to be effective. Learning is essential for financial maturity, but it takes longer than traditional adulthood. This is confirmed by my 3<sup>rd</sup> result (‘R3’)

## **R3. The age of financial maturity is 23 years.**

According to our traditional knowledge, the achievement of general maturity occurs around the age of 18 in correlation with the legal age of majority. In the examined sample, however, we can conclude that we can expect to reach financial maturity not at the age of 18 but later, from about the age of 23. This is because financial literacy and the knowledge that young people acquire in higher education are essential for financial maturity – even if they do not major in economics. The significance of age is given by the fact that the experience associated with age and a calmer habitus help to make more rational financial decisions. The importance of financial knowledge acquired in higher education is indicated by the fact that, according to the observations described in the literature, the level of financial knowledge acquired in primary and secondary education does not show any correlation with the decisions made in later life stages, which, of course, should not primarily mean to us that education in economics is essential in higher education, but rather that decision-makers in primary and secondary education should start implementing effective public financial education. The process has begun: Money Compass Foundation (*Pénziránytű Alapítvány*; founded in 2008 by *Diákhitel Központ Zrt.*, the Hungarian Banking Association, and the Hungaricana Magyar Bankszövetség és a Hungarian National Bank) or school money weeks are good indications of this fact. This attitude will or may change later with experience, as shown in the 4<sup>th</sup> result 4 (‘R4’).

**R4. The extent of the change in students' financial attitudes because of a crisis is most influenced by the nature of the work done while studying.**

The main determinant is whether students work in addition to their studies or not. Secondly, those who work outside of studying have a distinction between those who do mental and physical work. The biggest decline in attraction to finance characterised students with intellectual occupations in addition to their studies, while the smallest setback was peculiar to students without a job. This is probably since they have to solve far more non-simulation practical tasks related to their work and private life. And these solutions are not aimed at improving school grades; they have a real stake. In addition to knowledge, therefore, practical experience is also a powerful influence on financial behaviour. Therefore, as part of the paradigm shift in higher education, it is appropriate to combine theoretical knowledge with practical skills, such as the use of simulation games. Experience is also a source of expanding financial knowledge, which shows an interesting connection to the sense of financial security (5<sup>th</sup> result – ‘R5’).

**R5. Increasing the level of financial literacy also reduces the sense of security.**

I did not encounter this connection in the literature, so I classified it as one of the new research results. However, it does not contradict my finding in R2, that is, greater knowledge increases financial security. There, it was a question of security itself, while in this present result it was a subjective experience of security. The explanation here is the concept of ‘happy ignorance’. The bottom line is that those who in the absence of adequate knowledge do not know what potential emergencies to expect, do not feel threatened either. Sense of security also differs also between genders from among the groups according to demographic variables (6<sup>th</sup> result – ‘R6’).

**R6. Overall, men have a lower sense of financial security than women.**

A probable explanation for this may be the male model considered traditional in our culture, according to which it is the man's job to create the financial foundations for his and his family's livelihood. Therefore, men experience the requirement of 'mandatory success' as a greater burden, which impairs their self-esteem in terms of financial security. I would mention, however, that this gender gap is not seen in the subsample of economics majors. This suggests that a higher level of economic knowledge (and the associated financial activity and interest) in both sexes improves subjective self-esteem in financial security to such an extent that it 'overrides' even the impact of culturally fixed gender stereotypes. And this fact also shows the importance of the role of financial literacy. My 7<sup>th</sup> result ('R7'), too, addresses changing stereotypes.

**R7. Crises change financial preferences.**

Of the components of a financial culture, a sense of security depends solely on financial literacy. This is known to be exacerbated by environmental crises. It is enough to think only of the creditors of the 2008 crisis, or of families whose survival is threatened by unemployment following the restrictions imposed by Covid19. This may also explain why, because of a crisis, consumer behaviour is being replaced by an increased sense of responsibility. This is indicated by the desire to secure the future of children, as well as the foundation of a financially secure old age. This change can be observed regardless of country, and is even more pronounced among men than women, who are generally more family-oriented. My further observation in this regard is that not only do long-term preferences change, but there is also a shift in the short to medium term. Fear of losing jobs has led to a more tangible desire for a better home instead of higher pay – the fall in property prices during a pandemic has certainly contributed to a shift in preferences.

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